CT artifact

In computed tomography (CT), the term artifact is applied to any systematic discrepancy between the CT numbers in the reconstructed image and the true attenuation coefficients of the object.

Epidemiology

CT artifacts are common and can occur for various reasons. Knowledge of these artifacts is important because they can mimic pathology (e.g. partial volume artifact) or can degrade image quality to non-diagnostic levels.

Patient motion, which generates conflicts within the developed projection data, is a major cause of artifacts in clinical x-ray computed tomography (CT).

Classification

CT artifacts can be classified according to the underlying cause of the artifact.

Patient-based artifacts

motion artifact

transient interruption of contrast

clothing artifact

jewelry artifact

Physics-based artifacts

beam hardening

cupping artifact

streak and dark bands

metal artifact / high-density foreign material artifact

partial volume averaging

quantum mottle (noise)

photon starvation

aliasing

truncation artifact

Hardware-based artifacts

ring artifact

tube arcing

out-of-field artifact

air bubble artifact

helical and multichannel artifact

windmill artifact

cone beam effect

multiplanar reconstruction (MPR) artifact

zebra artifact

stair step artifact

Prevention

It is known that metal artifacts can be reduced by modifying standard acquisition and reconstruction, by modifying projection data and/or image data and by using virtual monochromatic imaging extracted from dual-energy CT.